WHAT IS CLAIMED IS:

1. A body motion detection device configured to be attached to a forearm of a human body to detect a body motion of the human body, comprising:

a body motion sensor unit configured and arranged to detect an acceleration caused substantially by a movement of the forearm during walking and an acceleration caused substantially by a movement of the forearm during running to output at least one body motion signal; and

a body motion component extracting section configured and arranged to extract a body motion component from said at least one body motion signal.

2. The body motion detecting as recited in claim 1, wherein

said body motion sensor unit includes

a first acceleration sensor configured and arranged to detect said acceleration caused by the movement of the forearm during walking and output a first body motion signal;

a second acceleration sensor configured and arranged to detect said acceleration caused by the movement of the forearm during running and output a second body motion signal; and

said body motion component extracting section configured and arranged to extract said body motion component based on said first and second body motion signals.

3. The body motion detection device as recited in claim 2, wherein

said first acceleration sensor is configured and arranged to detect an acceleration in a direction that is substantially perpendicular to an axis of the forearm, and

said second acceleration sensor is configured and arranged to detect an acceleration in a direction that is substantially perpendicular to a straight line formed between a shoulder and a wrist of the human body when the forearm is bent by a prescribed angle with respect to an upper arm of the human body.

4. The body motion detection device as recited in claim 2, wherein

said first acceleration sensor has an acceleration sensitivity direction that is substantially perpendicular to an axis of the forearm, and

said second acceleration sensor has an acceleration sensitivity direction that is rotated by a prescribed angle from the sensitivity direction of said first acceleration sensor.

5. The body motion detection device as recited in claim 4, wherein

said prescribed angle is set in a range between approximately 35° and approximately 65°.

6. The body motion detection device as recited in claim 2, wherein,

said body motion component extracting section includes

a first frequency analysis section configured and arranged to execute an frequency analysis of said first body motion signal,

a second frequency analysis section configured and arranged to execute an frequency analysis of said second body motion signal, and

a reference wave determining section configured and arranged to determine a reference wave for extracting said body motion component based on results of the frequency analysis from said first and second frequency analysis sections.

7. The body motion detection device as recited in claim 2, wherein

said body motion component extracting section includes

a combining section configured and arranged to output an integrated body motion signal by integrating said first and second body motion signals,

a frequency analysis section configured and arranged to execute an frequency analysis of said integrated body motion signal, and

a reference wave determining section configured and arranged to determine a reference wave for extracting said body motion component based on a result of the frequency analysis from said frequency analysis section.

8. The body motion detection device as recited in claim 2, wherein said body motion component extracting section includes

an amplifying section configured and arranged to output an amplified first body motion signal by amplifying said first body motion signal by a prescribed amplification rate,

a first frequency analysis section configured and arranged to execute a frequency analysis of said amplified first body motion signal,

a second frequency analysis section configured and arranged to execute a frequency analysis of said second body motion signal, and

a reference wave determining section configured and arranged to determine a reference wave for extracting said body motion component based on results of the frequency analysis from said first and second frequency analysis sections.

9. The body motion detection device as recited in claim 2, wherein said body motion component extracting section includes

a preprocessing calculation section configured and arranged to output an integrated body motion signal by integrating said first and second body motion signals after preprocessing said first and second body motion signals such that maximum amplitudes of said first

and second body motion signals become substantially equal to each other,

a frequency analysis section configured and arranged to execute a frequency analysis of said integrated body motion signal, and

a reference wave determining section configured and arranged to determine a reference wave for extracting said body motion component based on a result of the frequency analysis from said frequency analysis section.

10. The body motion detection device as recited in claim 2, wherein said body motion sensor unit includes an acceleration sensor configured and arranged to detect said acceleration caused by the movement of the forearm during walking and said acceleration caused by the movement of the forearm during running.

11. The body motion detection device as recited in claim 10, wherein said acceleration sensor is configured and arranged to detect an acceleration in a direction that is substantially perpendicular to an integrated vector formed by integrating a first vector toward a finger direction along an axis of the forearm and a second vector from a shoulder to a wrist of the human body along a straight line formed when the forearm is bent by a prescribed angle.

12. The body motion detection device as recited in claim 11, wherein an angle formed between said first vector and said integrated vector is set in a range between approximately 17° and approximately 33°.

13. The body motion detection device as recited in claim 10, wherein said body motion component extracting section includes

a frequency analysis section configured and arranged to execute an frequency analysis of said body motion signal, and

a reference wave determining section configured and arranged to determine a reference wave for extracting said body motion component based on a result of the frequency analysis from said frequency analysis section.

14. A pitch meter comprising:

a body motion detection device configured to be attached to a forearm of a human body to detect a body motion of the human body, said body motion detection device including

a first acceleration sensor configured and arranged to detect said acceleration caused by a forearm movement of the forearm during walking and output a first body motion signal,

a second acceleration sensor configured and arranged to detect said acceleration caused by the forearm movement during running and output a second body motion signal, and

a body motion component extracting section including

a first frequency analysis section configured and arranged to execute an frequency analysis of said first body motion signal,

a second frequency analysis section configured and arranged to execute an frequency analysis of said second body motion signal, and

a reference wave determining section configured and arranged to determine a reference wave for extracting said body motion component based on results of the frequency analysis from said first and second frequency analysis sections, said reference wave being a signal that is on the furthest low frequency side among signals

having a prescribed ratio of power to a highest power signal in the results of the frequency analysis; and

a pitch calculation section configured and arranged to calculate a pitch of the body motion of the human body based on said reference wave.

15. A step counter, comprising:

a body motion detection device configured to be attached to a forearm of a human body to detect a body motion of the human body, said body motion detection device including

a first acceleration sensor configured and arranged to detect said acceleration caused by a forearm movement of the forearm during walking and output a first body motion signal,

a second acceleration sensor configured and arranged to detect said acceleration caused by the forearm movement during running and output a second body motion signal, and

a body motion component extracting section including

a first frequency analysis section configured and arranged to execute an frequency analysis of said first body motion signal,

a second frequency analysis section configured and arranged to execute an frequency analysis of said second body motion signal, and

a reference wave determining section configured and arranged to determine a reference wave for extracting said body motion component based on results of the frequency analysis from said first and second frequency analysis sections, said reference wave being a signal that is on the

furthest low frequency side among signals having a prescribed ratio of power to a highest power signal in the results of the frequency analysis;

a pitch calculation section configured and arranged to calculate a pitch of the body motion of the human body based on said reference wave; and

a step count calculating section configured and arranged to calculate step counts from said pitch.

16. A wrist watch type information processing device comprising:

a main body configured and arranged to be placed on a forearm of a human body including a body motion detection device to detect a body motion of the human body, said body motion detection device including

a first acceleration sensor configured and arranged to detect said acceleration caused by a forearm movement of the forearm during walking and output a first body motion signal,

a second acceleration sensor configured and arranged to detect said acceleration caused by the forearm movement during running and output a second body motion signal, and

a body motion component extracting section including

a first frequency analysis section configured and arranged to execute an frequency analysis of said first body motion signal,

a second frequency analysis section configured and arranged to execute an frequency analysis of said second body motion signal, and

a reference wave determining section configured and arranged to determine a reference wave for extracting said body motion component based on results of the

frequency analysis from said first and second frequency analysis sections, said reference wave being a signal that is on the furthest low frequency side among signals having a prescribed ratio of power to a highest power signal in the results of the frequency analysis;

a pitch calculation section configured and arranged to calculate a pitch of the body motion of the human body based on said reference wave; and

a wrist band member coupled to said main body configured and arranged to removably place said main body on a wrist of the human body.

17. A method of detecting a body motion of a human body, comprising:

performing a body motion signal outputting process for detecting an acceleration caused substantially by a movement of a forearm during walking and an acceleration caused substantially by a movement of the forearm during running to output at least one body motion signal; and

performing a body motion component extracting process for extracting a body motion component from said at least one body motion signal.

18. The method as recited in claim 17, wherein

said body motion signal outputting process includes detecting the acceleration caused substantially by the movement of the forearm during walking to output a first body motion signal and detecting the acceleration caused substantially by the movement of the forearm during running to output a second body motion signal, and

said body motion component extracting process includes

performing a first frequency analyzing process for executing a frequency analysis of said first body motion signal,

performing a second frequency analyzing process for executing a frequency analysis of said second body motion signal, and

performing a reference wave determining process for determining a reference wave for extracting said body motion component based on

results of the frequency analysis from said first and second frequency analysis processes.

19. The method as recited in claim 17, wherein

said body motion signal outputting process includes detecting the acceleration caused substantially by the movement of the forearm during walking to output a first body motion signal and detecting the acceleration caused substantially by the movement of the forearm during running to output a second body motion signal, and

said body motion component extracting process includes

performing an integrating process for creating an integrated body motion signal by integrating said first and second body motion signals,

performing a frequency analyzing process for executing a frequency analysis of said integrated body motion signal, and

performing a reference wave determining process for determining a reference wave for extracting said body motion component based on a result of the frequency analysis from said frequency analyzing process.

20. The method as recited in claim 17, wherein

said body motion signal outputting process includes detecting the acceleration caused substantially by the movement of the forearm during walking to output a first body motion signal and detecting the acceleration caused substantially by the movement of the forearm during running to output a second body motion signal, and

said body motion component extracting process includes

performing an amplifying process for creating an amplified first body motion signal by amplifying said first body motion signal by a prescribed amplification rate,

performing a first frequency analyzing process for executing a frequency analysis of said amplified first body motion signal,

performing a second frequency analyzing process for executing a frequency analysis of said second body motion signal, and

performing a reference wave determining process for determining a reference wave for extracting a body motion component based on results of the frequency analysis from said first and second frequency analyzing processes.

21. The method as recited in claim 17, wherein

said body motion signal outputting process includes detecting the acceleration caused substantially by the movement of the forearm during walking to output a first body motion signal and detecting the acceleration caused substantially by the movement of the forearm during running to output a second body motion signal, and

said body motion component extracting process includes

performing a preprocessing calculation process for outputting an integrated body motion signal by integrating said first and second body motion signals after preprocessing said first and second body motion signals such that maximum amplitudes of said first and second body motion signals become substantially equal to each other,

performing a frequency analyzing process for executing a frequency analysis of said integrated body motion signal, and

performing a reference wave determining process for determining a reference wave for extracting said body motion component based on a result of the frequency analysis from said frequency analyzing process.

22. A method for detecting a pitch of a body motion of a human body, comprising:

performing a body motion signal outputting process for detecting the acceleration caused substantially by a movement of a forearm of the human body during walking to output a first body motion signal and detecting the acceleration caused substantially by a movement of the forearm during running to output a second body motion signal;

performing a body motion component extracting process for extracting a body motion component from at least one of said first and second body motion signals by performing

a first frequency analyzing process for executing a frequency analysis of said first body motion signal,

a second frequency analyzing process for executing a frequency analysis of said second body motion signal, and

a reference wave determining process for determining a reference wave for extracting said body motion component based on results of the frequency analysis from said first and second frequency analysis processes;

performing a signal extracting process for extracting signals having a prescribed ratio of power to a highest power signal based on said reference wave determined; and

performing a pitch calculating process for calculating a pitch from a signal that is on furthest low frequency side among said signals extracted by said signal extracting process.

23. A method for detecting a step count of a body motion of a human body, comprising:

performing a body motion signal outputting process for detecting an acceleration caused substantially by a movement of a forearm of the human body during walking to output a first body motion signal and detecting an acceleration caused substantially by a movement of the forearm during running to output a second body motion signal;

performing a body motion component extracting process for extracting a body motion component from at least one of the first and second body motion signals by performing

a first frequency analyzing process for executing a frequency analysis of said first body motion signal,

a second frequency analyzing process for executing a frequency analysis of said second body motion signal, and

a reference wave determining process for determining a reference wave for extracting said body motion component based on results of the

frequency analysis from said first and second frequency analysis processes;

performing a signal extracting process for extracting signals having a prescribed ratio of power to a highest power signal based on said reference wave determined;

performing a pitch calculating process for calculating a pitch from a signal that is on furthest low frequency side among said signals extracted by said signal extracting process; and

performing a step count calculating section for calculating the step counts from said pitch calculated.

24. A method for detecting a pitch of a body motion of a human body, comprising:

providing a wristwatch type information processing device configured and arranged to be placed on a forearm of a human body to detect the body motion;

performing a body motion signal outputting process for detecting an acceleration caused substantially by a movement of the forearm during walking to output a first body motion signal and detecting an acceleration caused substantially by a movement of the forearm during running to output a second body motion signal;

performing a body motion component extracting process for extracting a body motion component from at least one of said first and second body motion signals by performing

a first frequency analyzing process for executing a frequency analysis of said first body motion signal,

a second frequency analyzing process for executing a frequency analysis of said second body motion signal, and

a reference wave determining process for determining a reference wave for extracting said body motion component based on results of the frequency analysis from said first and second frequency analysis processes;

performing a signal extracting process for extracting signals having a prescribed ratio of power to the highest power signal based on said reference wave determined; and

performing a pitch calculating process for calculating a pitch from a signal that is on furthest low frequency side among said signals extracted by said signal extracting process.

25. A control program comprising instructions for performing:

controlling, by a computer, a body motion detection device attached to a human body to detect a body motion of the human body, said body motion detection device having a first acceleration sensor for detecting an acceleration caused substantially by a movement of a forearm of the human body during walking to output a first body motion signal and a second acceleration sensor for detecting an acceleration caused substantially by a movement of the forearm during running to output a second body motion signal;

executing a frequency analysis of said first body motion signal;

executing a frequency analysis of said second body motion signal; and

determining a reference wave for extracting a body motion component based on results of the frequency analyses of said first and second body motion signals.

26. A control program comprising instructions for performing:

controlling, by a computer, a body motion detection device attached to a human body to detect a body motion of the human body, said body motion detection device having a first acceleration sensor for detecting an acceleration caused substantially by a movement of a forearm during walking to output a first body motion signal and a second acceleration sensor for detecting an acceleration caused by a movement of the forearm during running;

integrating said first and second body motion signals to produce an integrated body motion signal;

executing a frequency analysis of said integrated body motion signal; and

determining a reference wave for extracting a body motion component based on a result of said frequency analysis.

27. A control program comprising instructions for performing:

controlling, by a computer, a body motion detection device attached to a human body to detect a body motion of the human body, said body motion detection device

having a first acceleration sensor for detecting an acceleration caused substantially by a movement of a forearm of the human body during walking to output a first body motion signal and a second acceleration sensor for detecting an acceleration caused substantially by a movement of the forearm during running to output a second body motion signal;

creating an amplified first body motion signal by amplifying said first body motion signal by a prescribed amplification rate;

executing a frequency analysis of said amplified first body motion signal;

executing a frequency analysis of said second body motion signal; and

determining a reference wave for extracting a body motion component based on results of said frequency analyses of said amplified first body motion signal and said second body motion signal.

28. A control program comprising instructions for performing:

controlling, by a computer, a body motion detection device attached to a human body to detect a body motion of the human body, said body motion detection device having a first acceleration sensor for detecting an acceleration caused substantially by a movement of a forearm of the human body during walking to output a first body motion signal and a second acceleration sensor for detecting an acceleration caused substantially by a movement of the forearm during running to output a second body motion signal;

outputting an integrated body motion signal by integrating said first and second body motion signals after preprocessing said first and second body motion signals such that maximum amplitudes of said first and second body motion signals become substantially equal to each other;

executing a frequency analysis of said integrated body motion signal; and

determining a reference wave for extracting a body motion component based on a result of said frequency analysis from said frequency analyzing process.

29. A control program comprising instructions for performing:

controlling, by a computer, a device having a body motion detection device comprising

a first acceleration sensor configured and arranged to detect said acceleration caused by the movement of the forearm during walking and output a first body motion signal,

a second acceleration sensor configured and arranged to detect said acceleration caused by the movement of the forearm during running and output a second body motion signal, and

a body motion component extracting section configured and arranged to extract a body motion component from said first and second body motion signals, said body motion component extracting section including

a first frequency analysis section configured and arranged to execute an frequency analysis of said first body motion signal,

a second frequency analysis section configured and arranged to execute an frequency analysis of said second body motion signal, and

a reference wave determining section configured and arranged to determine a reference wave for extracting said body motion component based on results of the frequency analysis from said first and second frequency analysis sections,

extracting signals having a prescribed ratio of power to a highest power signal based on said reference wave determined; and

calculating a pitch from a signal that is on furthest low frequency side among said signals extracted by said extracting signals.

30. The control program as recited in claim 29, wherein

said device having said body motion detection device is a pitch meter.

31. The control program as recited in claim 29, wherein

said device having said body motion detection device is a wristwatch type information processing device.

32. A control program comprising instructions for performing:

controlling, by a computer, a step counter having a body motion detection device comprising

a first acceleration sensor configured and arranged to detect said acceleration caused by the movement of the forearm during walking and output a first body motion signal,

a second acceleration sensor configured and arranged to detect said acceleration caused by the movement of the forearm during running and output a second body motion signal, and

a body motion component extracting section configured and arranged to extract a body motion component from said first and second body motion signals, said body motion component extracting section including

a first frequency analysis section configured and arranged to execute an frequency analysis of said first body motion signal,

a second frequency analysis section configured and arranged to execute an frequency analysis of said second body motion signal, and

a reference wave determining section configured and arranged to determine a reference wave for extracting said body motion component based on results of the frequency analysis from said first and second frequency analysis sections,

extracting signals having a prescribed ratio of power to a highest power signal based on said reference wave determined;

calculating a pitch from a signal that is on furthest low frequency side among said signals extracted by said extracting signals; and

calculating step counts from said pitch calculated.

33. A computer readable recording medium having a control program comprising instructions for performing:

controlling, by a computer, a body motion detection device attached to a human body to detect a body motion of the human body, said body motion detection device having a first acceleration sensor for detecting an acceleration caused substantially by a movement of a forearm of the human body during walking to output a first body motion signal and a second acceleration sensor for detecting an acceleration caused substantially by a movement of the forearm during running to output a second body motion signal;

executing a frequency analysis of said first body motion signal;

executing a frequency analysis of said second body motion signal; and

determining a reference wave for extracting a body motion component based on results of said frequency analyses of said first and second body motion signals.